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EXAMINER

RIZK, SAMIR WADIE

ART UNIT PAPER NUMBER

2133

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/652,673

Applicant(s)

JEONG ET AL.

Examiner

Sam Rizk

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTIONS

- Claims 1-20 have been submitted for examination
- Claims 1-20 have been rejected

Claim Objections

1. Claim 3 objected to because of the following miss-spelling informalities:
Claim 3 should recite: ".....comprises full or partial symbol combining'..
Appropriate correction is required.
2. Claim 19 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Drawings

3. The subject matter of this application admits of illustration by a drawing(s) and flow chart(s) to facilitate understanding of the invention. Applicant is required to furnish a drawing(s) and or flow chart(s) under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 6,10-20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kim et al. US publication no. 2003/0095532

(Hereinafter Kim) and further in view of Gopalakrishnan et al. US patent no. 6930981 (Hereinafter Gopalakrishnan)

4. In regard to claim 1, Kim substantially teaches:

- A method of link adaptation and code space management comprising the steps of:

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- encoding original transmission bits into initial turbo encoded symbols;
(Note: Fig 9, reference character 903 in Kim).
- storing the initial turbo encoded symbols;
(Note: Fig 9 reference character 905 in Kim)
- interleaving and transmitting the initial turbo encoded symbols;
(Note: Fig. 4, reference characters 451, 434, 441 and 443 in Kim)
- re-transmitting the turbo encoded symbols subsequent to selectively puncturing or repeating the turbo encoded symbols.
(Note: Section [0047], lines(17 and 18) in Kim)

However, Kim does not explicitly teach:

- determining the number of Walsh codes available for a desired user and a modulation and coding scheme (MCS) level according to carrier to interference (C/I) feedback values from a desired mobile station;
(Note: Col. 2, lines (60-67) and col. 3, Lines (1-7) in Gopalakrishnan)
- determining rate matching factors corresponding to the number of available Walsh codes and the MCS level;
- selectively puncturing or repeating the stored turbo encoded symbols based on the rate matching factors;

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Gopalakrishnan, in an analogous art, teach that the data rate selection (matching) is a wireless communication system teaches the optimal rate matching (spreading, modulation and coding) per code per cell based on C/I together with the power fraction and code space available (Note: Col. 8, lines (47-65) in Gopalakrishnan)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim with the teaching of Gopalakrishnan to include the teaching of the optimal rate matching (spreading, modulation and coding) per code per cell based on C/I together with the power fraction and code space available.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized the need to use subsets of standardized rates based on the available transmit power and/or the code space to minimize bandwidth and maximize throughput.

5. In regard to Claim 2, Kim substantially teach:

- The method according to claim 1, further comprising the steps of:
- receiving the transmitted initial turbo encoded symbols and the re-transmitted turbo encoded symbols subsequent to selectively puncturing or repeating the turbo encoded symbols;

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- re-deriving the rate matching factors in response to the number of code channels and MCS level of current re-transmissions and the initial transmission;
- selectively de-puncturing or de-repeating the received turbo encoded symbols based on the re-derived rate matching factors; and coded symbol combining the selectively de-punctured or de-repeated turbo encoded symbols.

(Note: Fig. 5 and sections [0070] and [0071] in Kim).

6. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim as combined with Gopalakrishnan as applied to claims 1-2 above, and further in view of the Applicant Admitted Prior Art (Hereinafter AAPA).

In regard to claims 3-5, Kim as combined with Gopalakrishnan substantially teaches all the limitations in claim 2.

However, Kim as combined with Gopalakrishnan does not explicitly teach:

- the step of coded symbol combining comprises full or partial symbol combining.

However, AAPA discloses the step of coded symbol combining comprises full or partial symbol combining (Note: Applicant specifications page 1, lines (26 and 27)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim as combined with

Gopalakrishnan with the teaching of AAPA to include the teaching of symbol combining comprises full or partial symbol combining.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized the need to develop HSDPA standard compliant protocol to support system inter-operability.

7. In regard to claim 4, AAPA substantially teaches:

- The method according to claim 2, wherein the step of coded symbol combining comprises Chase combining.

(Note: AAPA page 1, line 18 in AAPA)

8. In regard to claim 5, AAPA substantially teaches:

- The method according to claim 2, wherein the step of coded symbol combining comprises Incremental Redundancy combining.

(Note: AAPA page 1, line 19 in AAPA)

9. In regard to claim 6, Kim substantially teaches:

- The method according to claim 1, wherein the step of storing the initial turbo encoded symbols comprises storing the initial turbo encoded symbols in a hybrid automatic re-transmission request (H-ARQ) memory.

(Note: Fig. 9, reference character 905 in Kim).

10. In regard to claim 7, Kim teaches:

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- The method of link adaptation and code space management according to claim 1, wherein the step of encoding original transmission bits into initial turbo encoded symbols comprises selectively turbo puncturing or avoiding puncturing of the original transmission bits to generate an encoded packet (EP) having the lowest code rate required by a desired incremental redundancy (IR).

(Note: Section [0080] in Kim)

11. Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim as combined with Gopalakrishnan as applied to claims 1 and 7 above, and further in view of Kim et al. US patent no. 6438119 (Hereinafter Kim119).

In regard to claim 8, Kim as combined with Gopalakrishnan teaches substantially all the limitations in claim 7.

However, Kim as combined with Gopalakrishnan does not explicitly teach:

- The method according to claim 7, further comprising the step of determining the radio frame length according to a resource management algorithm.

However, Kim119, in an analogous art, that teach the data communication device and method for mobile communication system with dedicated control channel teaches:

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- A CDMA communication system provides a dedicated control channel capable of efficiently communicating control messages between a base station and a mobile station. In a dedicated control channel transmission device, a controller determines a frame length of a message to be transmitted and outputs a frame select signal corresponding to the determined frame length. A message generator generates frame data of the message to be transmitted according to the frame select signal. A transmitter spreads the frame data and transmitting the spread frame data through a dedicated control channel. In a dedicated control channel reception device, a despreaders despreads a received signal. A first message receiver deinterleaves and decodes the despread signal in a first frame length to output a first message, and detects a first CRC corresponding to the decoded signal. A second message receiver deinterleaves and decodes the despread signal in a second frame length to output a second message, and detects a second CRC corresponding to the decoded signal. A controller selects one of the first and second messages according to first and second CRC detection results.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim as combined with Gopalakrishnan with the teaching of Kim119 to include the teaching of variable frame length according to a resource management protocol.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized the need maximize throughput and minimize traffic delays to optimize multi-media quality of services.

12. In regard to claim 9, Kim substantially teaches;

- The method according to claim 8, wherein the step of determining rate matching factors corresponding to the number of available Walsh codes and the MCS level further comprises

determining the rate matching factors corresponding to the radio frame length.

(Note: Claim 3 in Kim)

13. In regard to claim 10, Gopalakrishnan substantially teaches:

- The method according to claim 9, wherein the steps of interleaving and transmitting the initial turbo encoded symbols comprise:
- generating a sub-packet (SP) from the EP based on the rate matching factors for this initial transmission; and transmitting the SP.

(Note: Col. 2, lines (55-65) in Gopalakrishnan)

14. In regard to claim 11, AAPA substantially teaches:

- The method according to claim 10, wherein the steps of selectively puncturing or repeating the stored turbo encoded symbols based on the rate matching factors and re-transmitting the turbo-encoded symbols subsequent to selectively puncturing or repeating the turbo encoded symbols are replaced by the steps of determining a new set of rate matching factors according the MCS, number of Walsh codes, and radio frame length in response to an unsuccessful SP decoding signal via an acknowledge channel from a receiver; determining a new SP based on the new set or rate matching factors; and re- transmitting the new SP.

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(Note: page 3, lines (13-22) in AAPA)

15. In regard to claim 12, Kim teaches:

- The method according to claim 11, further comprising the steps of:
 - receiving the transmitted initial SP and the re-transmitted new SP;
 - re-deriving the rate matching factors in response to the number of code channels, MCS level of current re-transmissions and the initial transmission, and parameters known to both transmission and receiving sides, wherein the parameters are selected from the group consisting of radio frame index, and scrambling code;
 - selectively de-puncturing or de-repeating the received sub-packets based on the re-derived rate matching factors; and
 - coded symbol combining the selectively de-punctured or de-repeated sub-packets, wherein the coded symbol combining is selected from the group consisting of IR combining, full symbol combining, and partial symbol combining.

(Note: Fig. 5 and sections [0070] and [0071] in Kim).

16. Claim 13 is rejected for the same reasons as claims 2 and 10 combined.

17. In regard to claim 14, AAPA substantially teaches:

- The method according to claim 13 further comprising the steps of:

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- determining a new set of rate matching factors according the MCS, number of Walsh codes, and radio frame length in response to an unsuccessful SP decoding signal via an acknowledge channel from a receiver;
- determining a new SP based on the new set of rate matching factors; and re-transmitting the new SP.

(Note: page 3, lines (13-22) in AAPA)

18. In regard to claim 15, Kim substantially teaches:

- The method according to claim 14 further comprising the steps of:
- receiving the transmitted initial SP and the re-transmitted new SP;
- re-deriving the rate matching factors in response to the number of code channels, MCS level of current re-transmissions and the initial transmission, and parameters known to both transmission and receiving sides, wherein the parameters are selected from the group consisting of radio frame index, and scrambling code;
- selectively de-puncturing or de-repeating the received sub-packets based on the re-derived rate matching factors; and coded symbol combining the selectively de-punctured or de-repeated sub-packets, wherein the coded symbol combining is selected from the group consisting of IR combining, full symbol combining, and partial symbol combining.

(Note: Section [0075] in Kim)

19. Claim 16 is rejected for the same reasons as claims 1 and 6 combined.

20. In regard to claims 17 and 18, Kim119 substantially teaches:

- The link adaptation and code space management system according to claim 16, further comprising:
- a transmission block interleaver operational to selectively interleave transmitted symbols;
- a transmission modulator operational to modulate the transmitted symbols;
- a receive demodulator operational to demodulate received symbols; and
- a receive block interleaver operational to selectively interleave the demodulated symbols.
- The link adaptation and code space management system according to claim 16,
- wherein the channel encoder comprises a turbo encoder.

(Note: Fig. 5A in Kim119)

21. In regard to claim 20, Gopalakrishnan substantially teaches:

- The link adaptation and code space management system according to claim 16, wherein the receive rate matching stage is operational to re-generate the rate matching parameters based on the number of available Walsh codes, MCS level, and parameters known to both transmission and receiving sides

selected from the group consisting of radio frame index, and scrambling code.

(Note: Col. 5, lines (27-40) in Gopalakrishnan)

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Kim et al. US publication no. 2003/0007476 teaches apparatus and method for transmitting and receiving data in a CDMA mobile communication system.
- Kim et al. US publication no. 2003/0171121 teaches apparatus and method for performing coding and rate matching in a CDMA mobile communication system
- Frederiksen et al. US publication no. 2004/0028020 teaches method and system for transport block size signaling based on modulation type for HSDPA
- Freiderg et al. US patent no. 6788657 teaches universal mobile telephone system network with improved rate matching method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Rizk whose telephone number is (571) 272-8191. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819.

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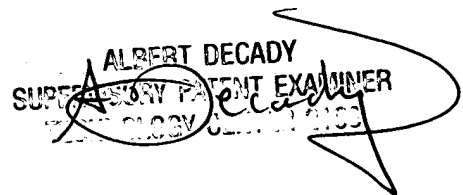
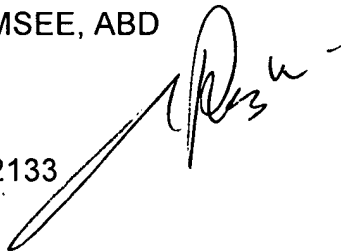
The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronics Business Center (EBC) at 866-217-9197 (toll-free)

Sam Rizk, MSEE, ABD

Examiner

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